
THE EDUCATION OF CANDIDATES FOR MEDICAL SCHOOL*

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THE arguments about preparation, whether in a learned profession or before entrance to the special training, are bound to be endless. There is no best preparation early on and, judging from the eternal complaints of the professionals before or after graduation, there is hardly ever any good preparation. The main reason for this dissatisfaction is that the contingencies of the time and the place, the men and the imagined "world outside," all lead to an infinity of compromises and mistakes, which in turn are repaired or renewed after a shorter or longer lapse. Anyone who wants to remind himself of what an actual situation is need only read in a recent issue of *Science* (volume 178, October 20, 1972) the description of reforms at the Michigan State University Medical School.

If things are so, then it is futile to draw up lovely plans of undergraduate study leading to medical school. The curriculum will be what it will be, different in every college, apt or inapt for this or that student, for this or that school which admits him. It therefore seems a better use of time and thought to deal mainly with principles: not high-flown abstractions defining the ideal, but heuristic, working principles—adapted to present-day use because they arise from present-day complaints. Such principles need to be stated, or rather restated, only because they are forgotten in the argumentative search for the perfect curriculum.

While the right preparation for medicine is now at issue, the charm and zest have manifestly gone out of the old college course, the liberal arts course of which most medical schools approved at least in theory, and which took for granted certain principles that it was not necessary to reconsider during minor alterations of the scheme. That old course

*Presented in a panel, Education of the Premedical Student in the Humanities and the Biological and Physical Sciences, as part of a *Symposium on the Education of Tomorrow's Physicians* held by the Committee on Medical Education of the New York Academy of Medicine on October 12, 1972.

no longer works. It is suspect as being bourgeois, elitist, and liberal in the bad sense. Where it survives it is attended with listlessness or attacked as irrelevant. The reasons given may be mistaken or foolish, but the response is just. Hence there is a double need for being radical, that is, going back to the roots and looking at the means and ends of higher education.

I start with an assumption which I hope may be widely shared, that there is no substitute for intelligence. No amount of machinery, team work, or fresh, slick methods of instruction or learning can replace or make superfluous the possession and use of intelligence. On the contrary, the cleverer the gadget or gimmick the more it requires intelligence to use it, for its very power to shortcut former efforts of mind makes it a potential trap and a danger. Its merit, if any, is to liberate intelligence from certain routine operations in order to concentrate it at some other point.

Now intelligence is a given. It is not manufactured or engineered. We need not worry about how given or where from, for it is abundant. The young whom we may find sullen or lazy or destructive have intelligence in plenty. Modern canons of health and diet have liberated large amounts of intelligence, and it is only a question of inducing the possessors to express it. This is done by the simple means of giving them an object they recognize as fitting.

The simplest object to arouse a live intelligence when the student is young is an exercise that appears likely to develop it. For youthful intelligence is ambitious, as well as easily blunted and discouraged. Everybody has witnessed, on the street or in a public vehicle, the spectacle of a bright child asking his parent a sensible question and being put off with nonsense or cut down with impatience. The *locus classicus* of this recurring situation is the line in Ring Lardner's story in which a child puts a question to his father and what follows is: " 'Shut up!' he explained."

Assuming that the young native intelligence has survived a normal amount of such treatment in various forms, ranging from harsh stupidity to incompetent teaching, we may say that higher education—the college course—has the goal of developing that intelligence in special ways for the highest tasks of society. These include the satisfaction of certain men and women in the play of intelligence itself, without immediate goals.

If anyone wants to call this definition of what higher education is supposed to do "the production of an elite," he is free to do so, but he will not be using his best intelligence in so naming it. An elite implies the ruling power, which a high education rarely confers. Let the cliché-thinker call the role of higher education "replenishing the cadres of competence for a complex welfare civilization" and he may find the social scenery more attractive. The argument is trivial. The point is, we must manage to enhance and give scope to our national stock of intelligence.

The test, then, of a school, a curriculum, an entrance or exit examination is whether it bears to trained intelligence a favoring or a repressive—possibly destructive—relation. I do not suggest that in judging individuals we exclude from consideration character, habits, ambition. These traits will be present or lacking in varying amounts, and the mixture will form in each person a peculiar entity that must be assessed as a whole. But in defining ahead of time kinds of persons and arrangements of study, intelligence is the prime element required. Strictly speaking, no other element, in fact, can be required; no man should be expected to say: "see how virtuous I can be."

Again, in the design of higher education let us forget the absurd notion that was so popular a few years ago when our computerized prophets predicted that soon everybody could earn his living by a couple of hours' work a week and would therefore need familiarity with the treasures of art and literature to keep him from being bored. The employment of leisure must remain a private affair—the last human concern to be regimented or made the subject of propaganda—if leisure is to deserve the name. Conversely, higher education is a public concern and, as such, is designed for utility, on the highest plane as well as in the middle range.

It remains to say how intelligence, when rightly valued, is to be trained. The main directions are, I think, clear enough. They are two, of which the first is, naturally, understanding, particularly understanding of systems, which among us are ever more numerous and complicated. Understanding systems suggests at once mathematics, computers, and the like, but what I have in mind includes such systems as the alphabet and the language, the understanding of which today is widely deficient. The absurd "look-and-say" method of teaching reading has made many cryptoilliterates. The ability to grasp the meaning

of a block of print, to hold the meaning accurately, and to reproduce it in speech and writing clearly and briefly is nowadays a rare accomplishment. I invite medical educators to examine attending physicians' reports on their hospital patients and say what this perusal suggests to their critical minds.

The order and discipline of the intelligence which alone produces understanding have long been neglected throughout the course of instruction in favor of a putative creativity. The result has been that excellent minds have never learned to oversee their own mental operations. Such minds do not know—they do not even suspect—what more they ought to know in order to know safely what they do know. It is not a case of a little learning being dangerous—no one is omniscient. It is the far worse case of a mind never turning in upon itself, scanning its gaps, and deducing the way to fill them. Such an unfortunate mind is, as it were, always filling the whole room of its consciousness with glaring light and never discovering the dark holes and corners beyond.

Systems do not, of course, constitute the entire world of mind; understanding therefore does not suffice. Accordingly the second direction in which intelligence must be trained is that of imagination. By this term I do not mean “fancy” or anything like the creativity I just set aside. Let the truly creative be creative—in art, in science, in government—and we shall all be grateful. But that is the work of a special imagination, which is not the one I have in mind here. The imagination that may be trained and developed is that which Pascal refers to in his *Pensées* as *finesse*—the opposite of geometry, of system. We may call it intuition, perceptiveness, tact, diagnostic skill, fertility in devising experiments, or framing hypotheses. It is the not being bound down to routine, even one's own. It may be a rapid and partly unconscious calculation of possibilities and their pluses and minuses. It is in any case not reducible to rules; it is the freedom of the intelligence, its ability to play.¹

With these two directions set as paths of development we can ask

¹Let it be said in passing that the stimulation of the medical student's imagination, which many people today wish were more active and humane, will not be easy to arouse if his teachers tell him continually that he is a machine, a physicochemical arrangement of prefabricated, predetermined parts which work like a computer tied to a pump and a stove. In a machine the output never equals the input but falls below it. In a good student the sum of proteins and carbohydrates is far exceeded by what can be coaxed out of him; and, oddly enough, much of the surplus that he can produce in imagination and understanding has no survival value in the struggle with other species. It is gratuitous, like music and astrophysics.

again what kind of college work is most likely to train the intelligence for medicine, law, or any other profession. But the answer will be in the form of a probability, not in the form of a solution to a problem. All will depend on the way in which subjects are chosen and studied and taught. They must be taught as exact knowledge (systems) and also as incitements to speculation (imagination). In other words subjects are complicated and also complex. What is complicated can be analyzed, taken apart, and put together again; what is complex must be taken in as a whole and the perception tested by renewed insights and their adequacy in practice.

On this view it should seem as if physics (including geology), chemistry, biology, mathematics, history, the languages, and the great literatures in English or in translation would provide suitable materials for attempting to train the understanding and the imagination together. By going about it the right way, the visual, auditory, and muscular as well as the conceptual imagination can be exercised through these subjects, which are far from being all the arts or all the liberal arts, and additions to them may be and perhaps must be made. Nothing I say here is meant to dismiss or downgrade any subject that can be properly studied: that is, a subject reducible to principles and which affords scope for general and speculative views while requiring the assimilation of a body of facts and terms.

My concern is not, I repeat, to prescribe or even to suggest a curriculum. Rather, it is to describe what in the present state of affairs higher education should aim at; and this alone brings me to mention the well-tried materials available to work with. We are choked with information, we sprout new sciences, disciplines, and terminologies incessantly, at an ever more rapid rate. We have managed to disgust the intelligent young with our mandarin system of qualifying for careers. We have taught them the liberal arts with a dubious connotation of philosophic or political liberalism that now seems to them absurd. It is time to return to the idea that being a master of arts means first of all knowing how to do something. The obvious "doing," which is worth training for, is thinking: that is, understanding and imagining, with the due speed, accuracy, and right aim that mastery implies: all of which may be summed up as giving form and strength to the irreplaceable, all-purpose, flexible, and exuberant power which is human intelligence.